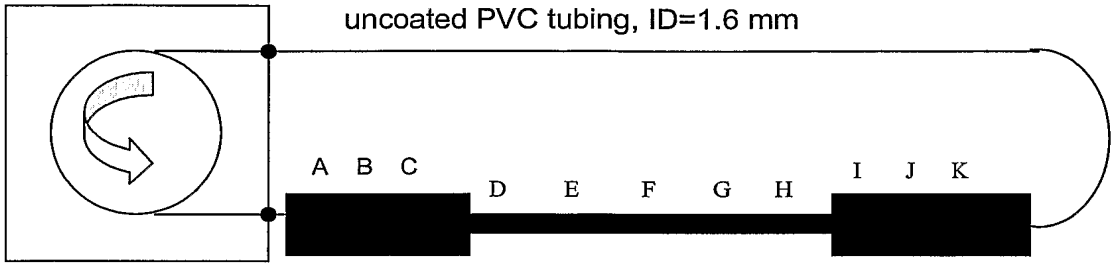
FIG. 1

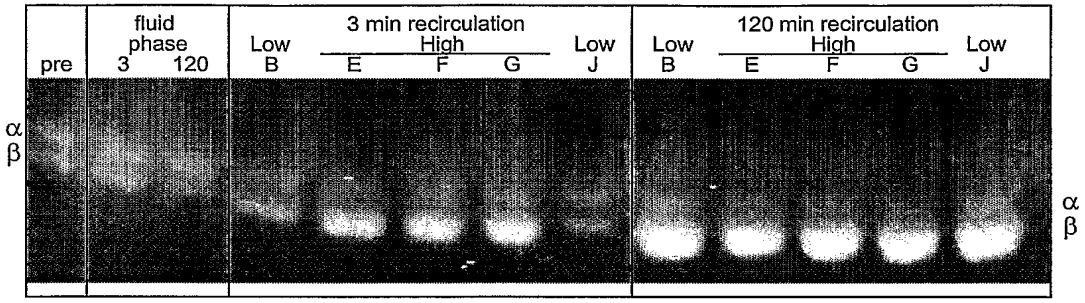
IN VITRO FLOW MODEL



Heparin-coated CBAS pvc tubing

	ID = 3 mm	h = 0.1 mm , w = 4.6 mm	ID = 3 mm
flow velocity, Vz	1.7 cm/sec	25 cm/sec	1.7 cm/sec
wall shear rate, wsr	44 s^{1}	15,000 s^{1}	44 s^{1}
	Low	High	Low

FIG. 2


pre
fluid phase
3
120
3 min recirculation
Low
High
Low
B
E
F
G
J
120 min recirculation
Low
High
Low
B
E
F
G
J
α
β
α
β

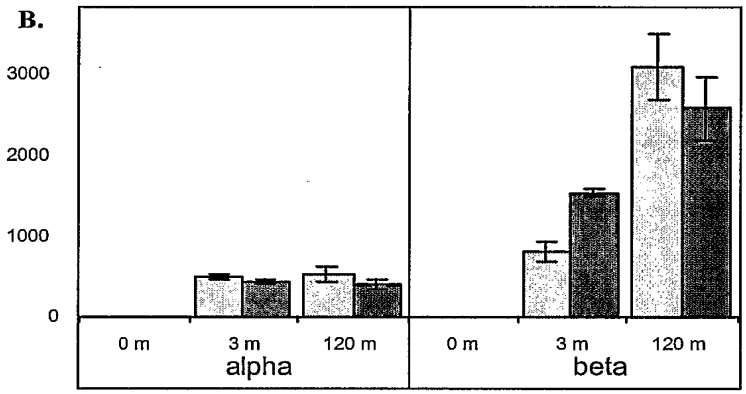
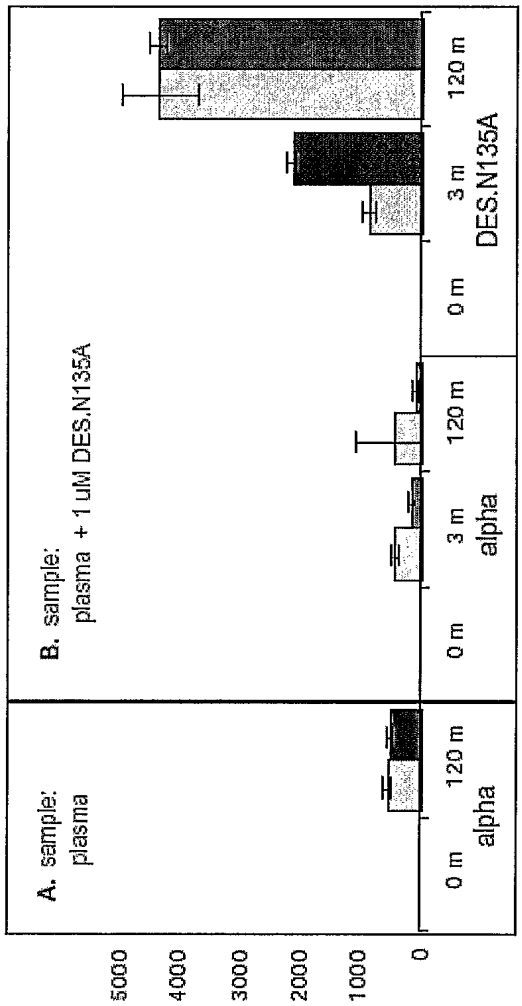
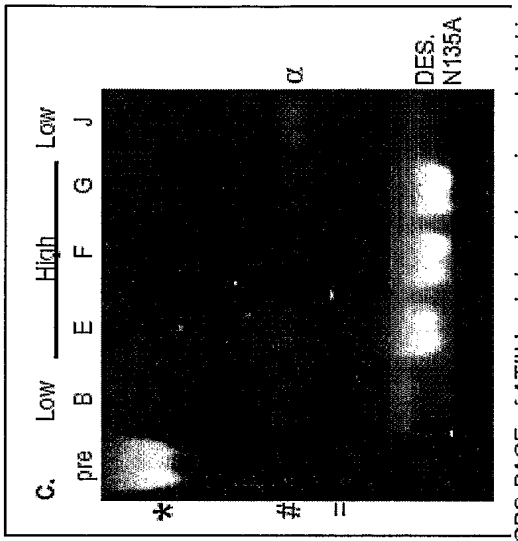

B.
3000
2000
1000
0
0 m
3 m
120 m
alpha
0 m
3 m
120 m
beta

FIG. 3



Surface-bound ATIII (ng / segment, avg ± SD) for heparin-coated tubing exposed to plasma ± DES.N135A ATII under low (light gray) and high (dark gray) flow velocity conditions.



SDS-PAGE of ATIII loaded onto heparin-coated tubing during 3m recirculation. "pre" is the pre-circulation sample containing diluted plasma (50%) plus 1 uM DES.N135A. Low and high flow segments are marked as in Fig. 1.

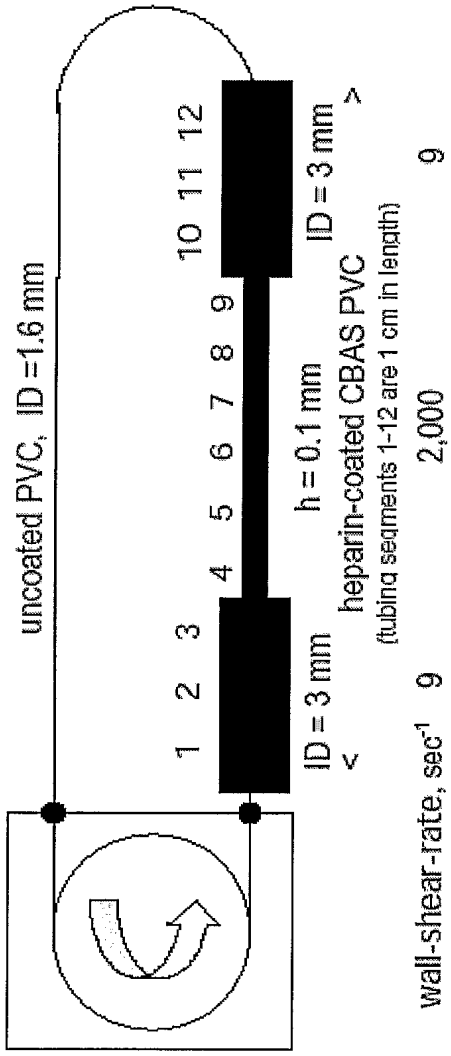

uncoated PVC, ID =1.6 mm
1 2 3 4 5 6 7 8 9 10 11 12
ID = 3 mm
h = 0.1 mm
ID = 3 mm
heparin-coated CBAS PVC
(tubing segments 1-12 are 1 cm in length)
wall-shear-rate, sec-1 9 2,000 9

FIG. 4

FIG. 5

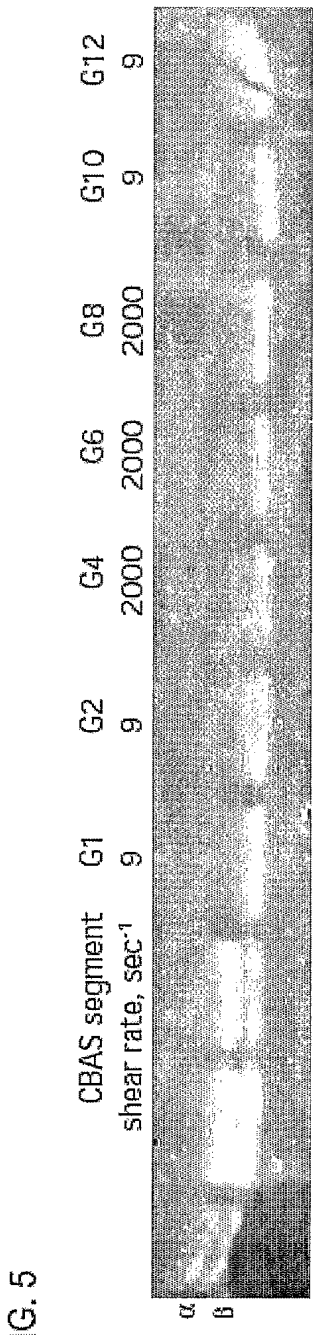

CBAS segment
shear rate, sec-1
G1
9
G2
9
G4
2000
G6
2000
G8
2000
G10
9
G12
9
α
β
200 ng
pre
circ
(a)
pre
circ
(b)
post
circ

FIG. 6

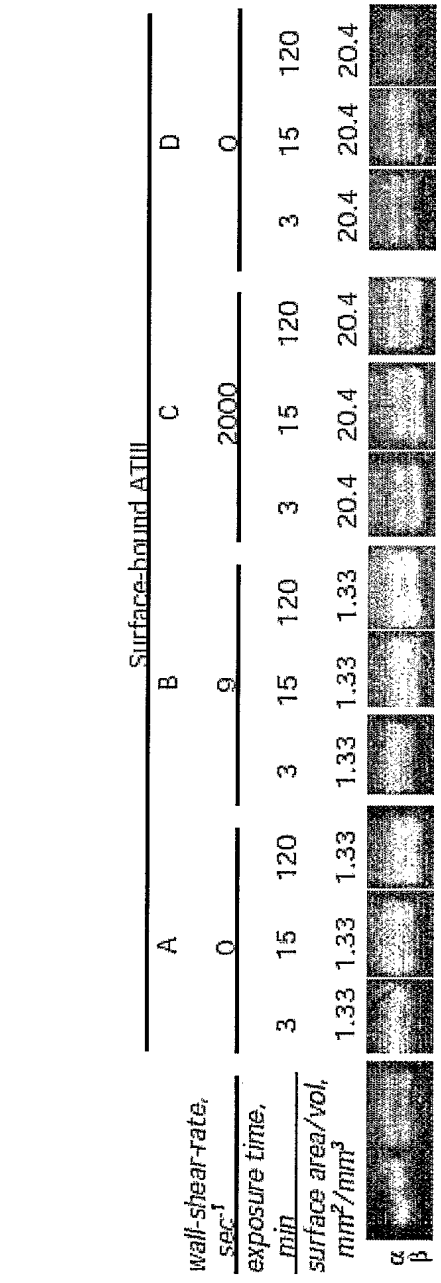

Surface-bound ATIII
A
B
C
D
wall-shear-rate, sec-1
0
9
2000
0
exposure time, min
3 15 120 3 15 120 3 15 120 3 15 120
surface area/vol, mm2/mm3
1.33 1.33 1.33 1.33 1.33 1.33 20.4 20.4 20.4 20.4 20.4 20.4
α
β
pre
circ
1:1
α/β
std

FIG. 7

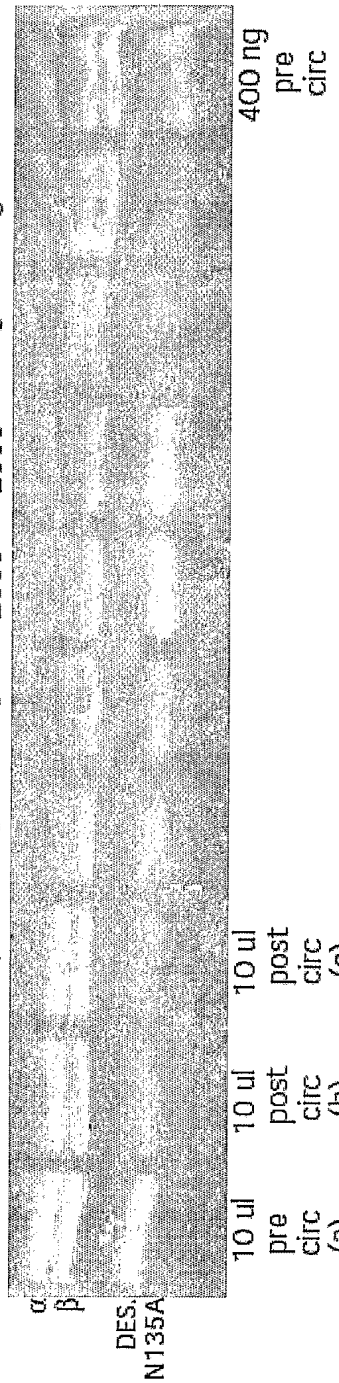

α
β
DES. N135A
10 ul pre circ (a)
10 ul post circ (b)
10 ul post circ (c)
CBAS segment
shear rate, sec-1
B2 9
B3 9
B5 2000
B7 2000
B11 9
B12 9
400 ng pre circ

FIG. 8

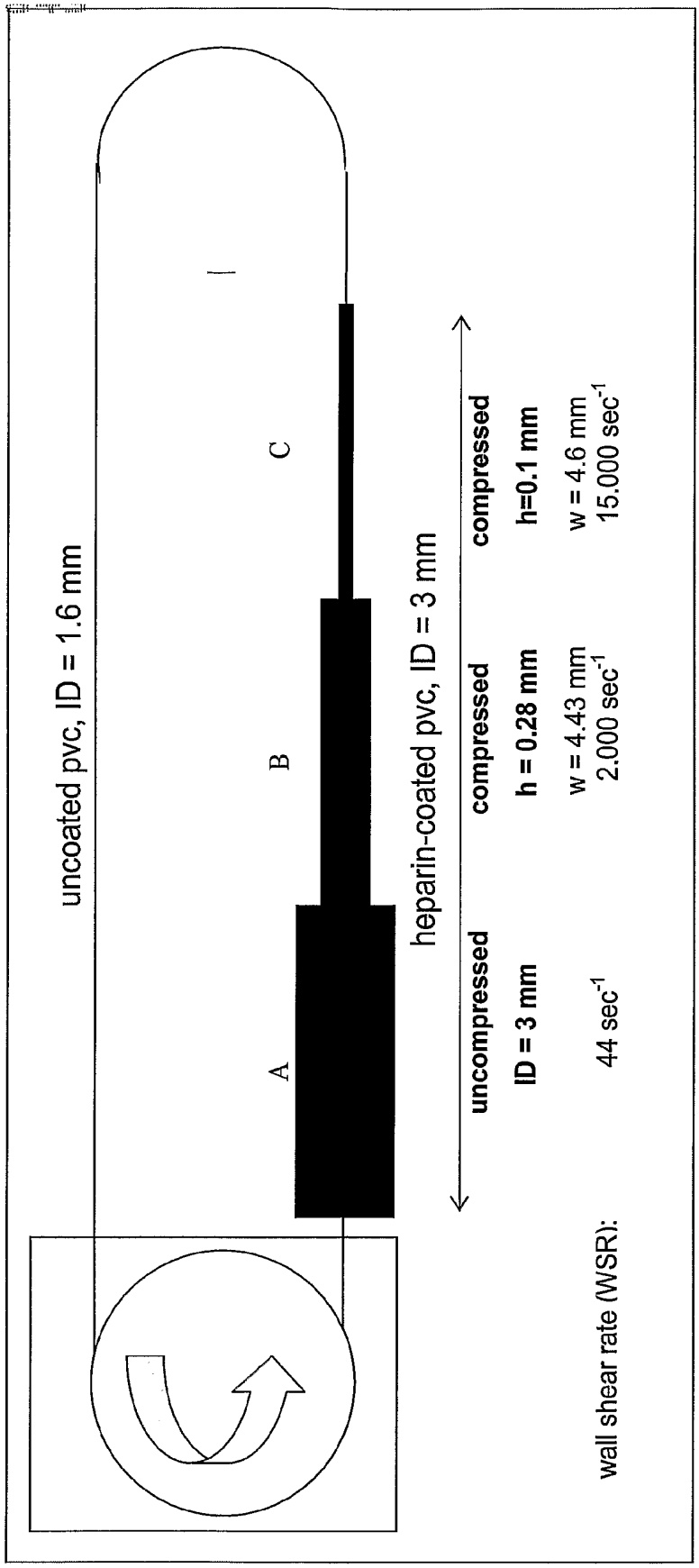

IN VITRO FLOW MODEL
uncoated pvc, ID = 1.6 mm
heparin-coated pvc, ID = 3 mm
A
B
C
uncompressed
compressed
compressed
ID = 3 mm
h = 0.28 mm
h=0.1 mm
w = 4.43 mm
w = 4.6 mm
wall shear rate (WSR):
44 sec-1
2.000 sec-1
15.000 sec-1

FIG. 9 Panel A

A. WALL SHEAR RATE – DEPENDENT DIFFERENTIAL BINDING OF ATIII ISOFORMS TO HEPARIN-COATED SURFACES

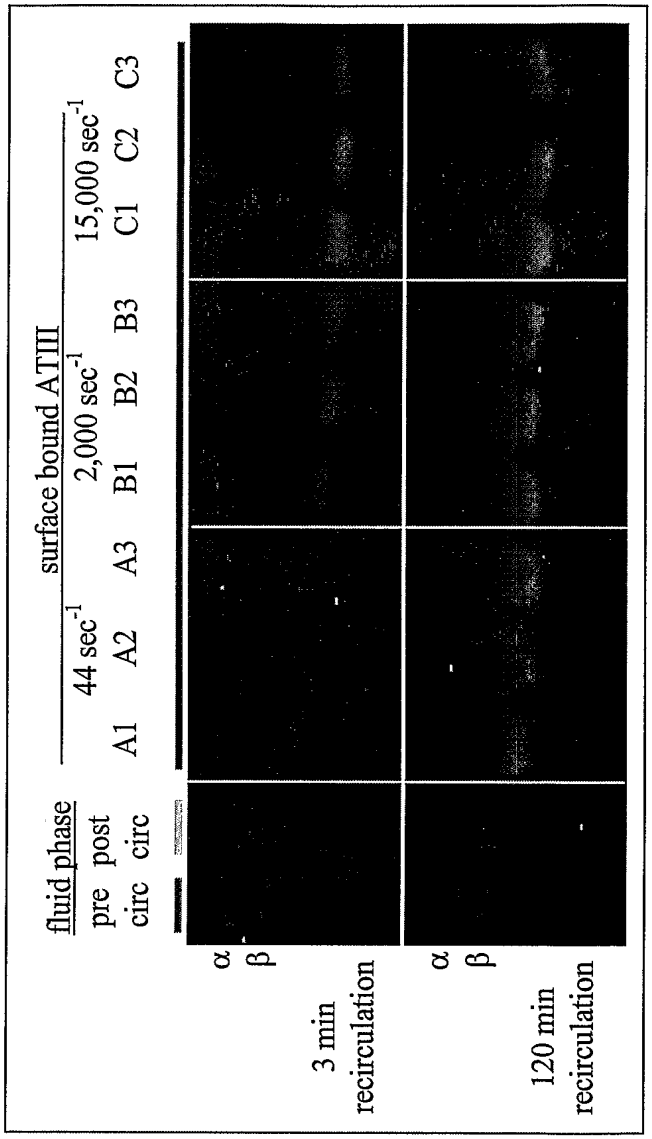


Fig. 9 Panel B

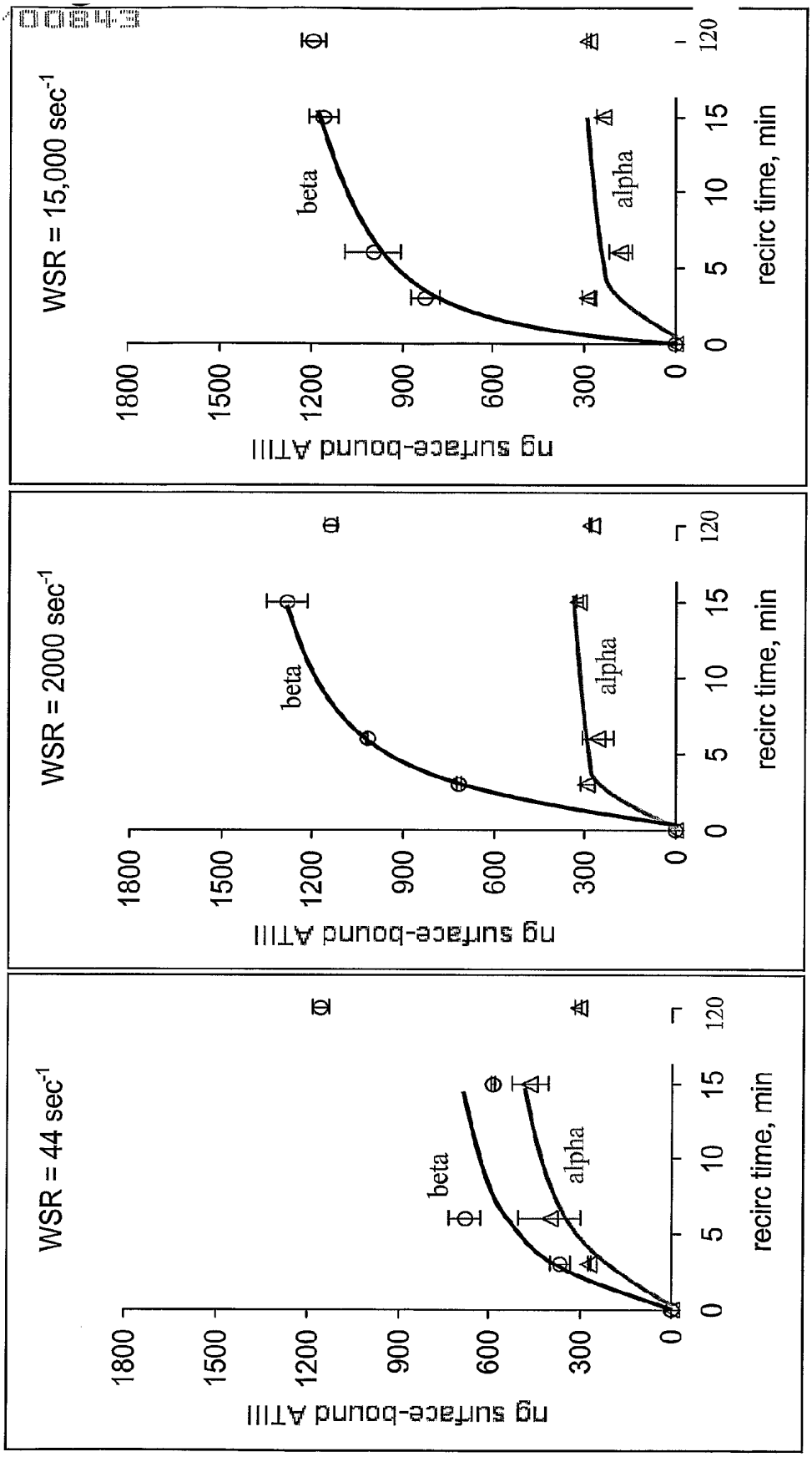

WSR = 44 sec-1
WSR = 2000 sec-1
WSR = 15,000 sec-1
ng surface-bound ATIII
recirc time, min
beta
alpha
0
300
600
900
1200
1500
1800
5
10
15
120

Fig. 9 Panel C

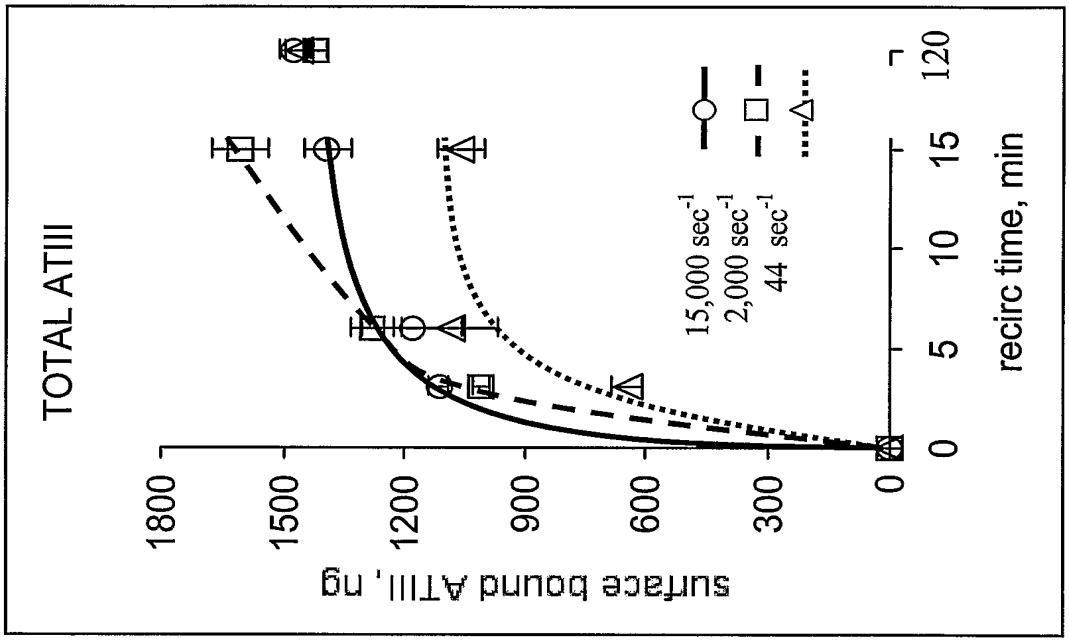

TOTAL ATIII
surface bound ATIII, ng
1800
1500
1200
900
600
300
0
0
5
10
15
120
recirc time, min
15,000 sec-1
2,000 sec-1
44 sec-1

Fig. 10 Panel A

RECOMBINANT DES.N135A ATIII LOADS ONTO HEPARIN-COATED BIOMATERIAL SURFACES M
EFFICIENTLY THAN ENDOGENOUS PLASMA ATIIIS

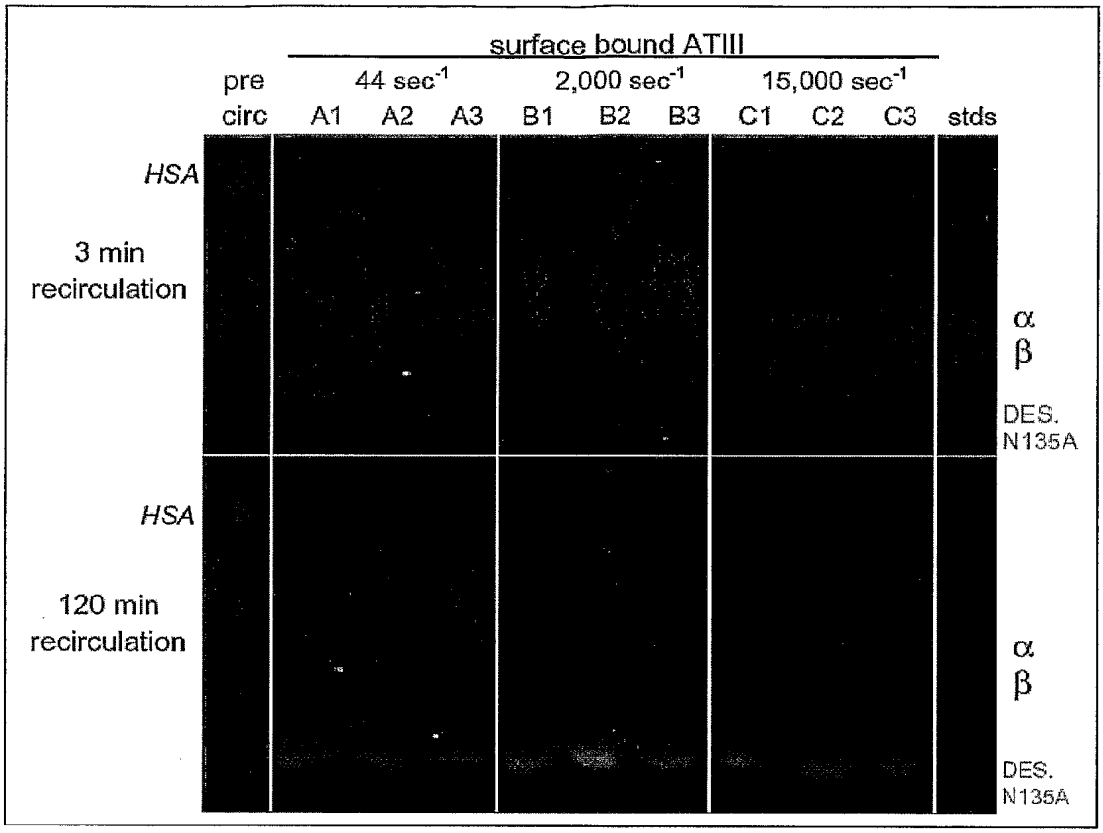


Fig. 10 Panel B

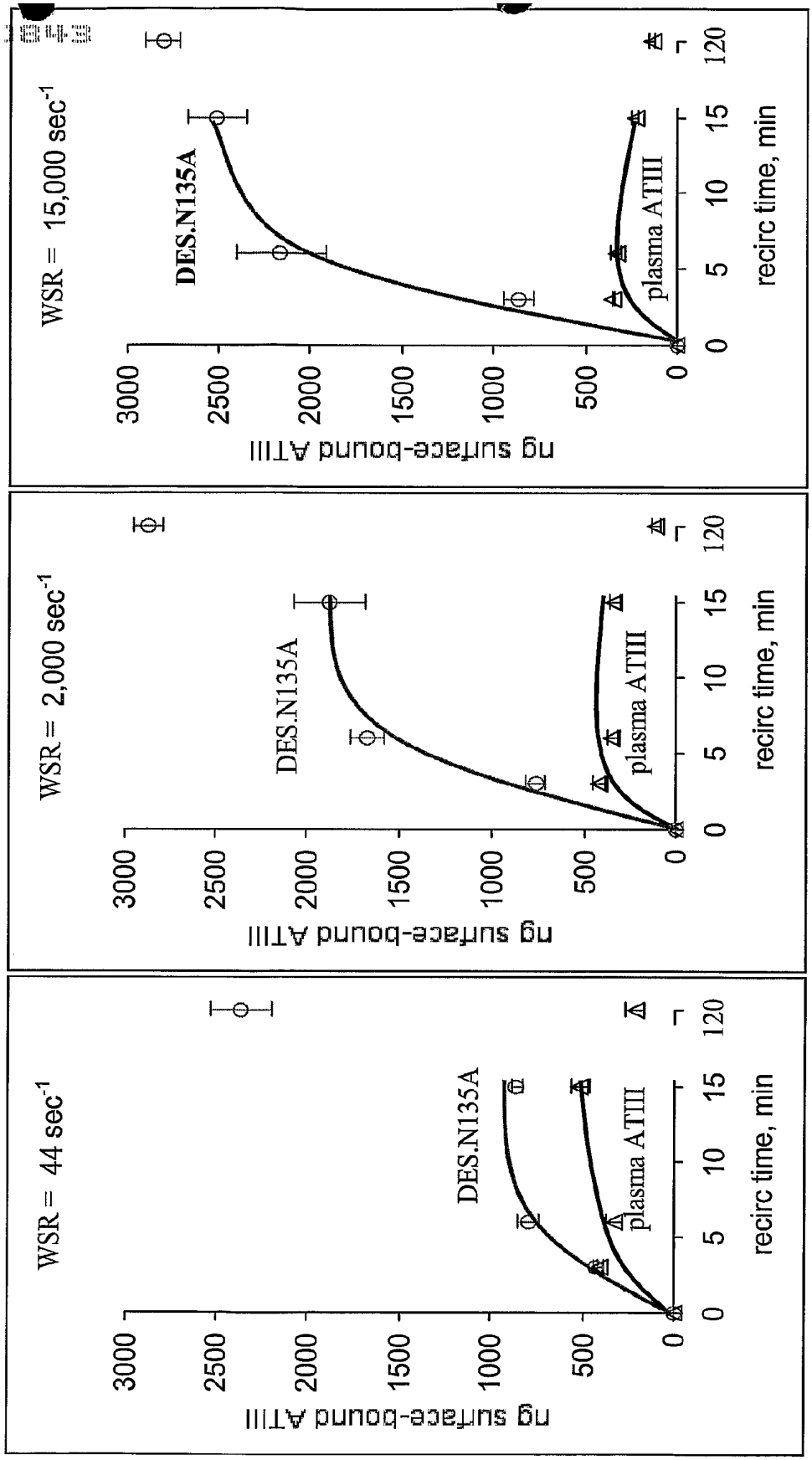


FIG. 11 Panel A

FUNCTIONAL INHIBITION OF FLOWING THROMBIN BY SURFACE-TARGETED ATIIIs

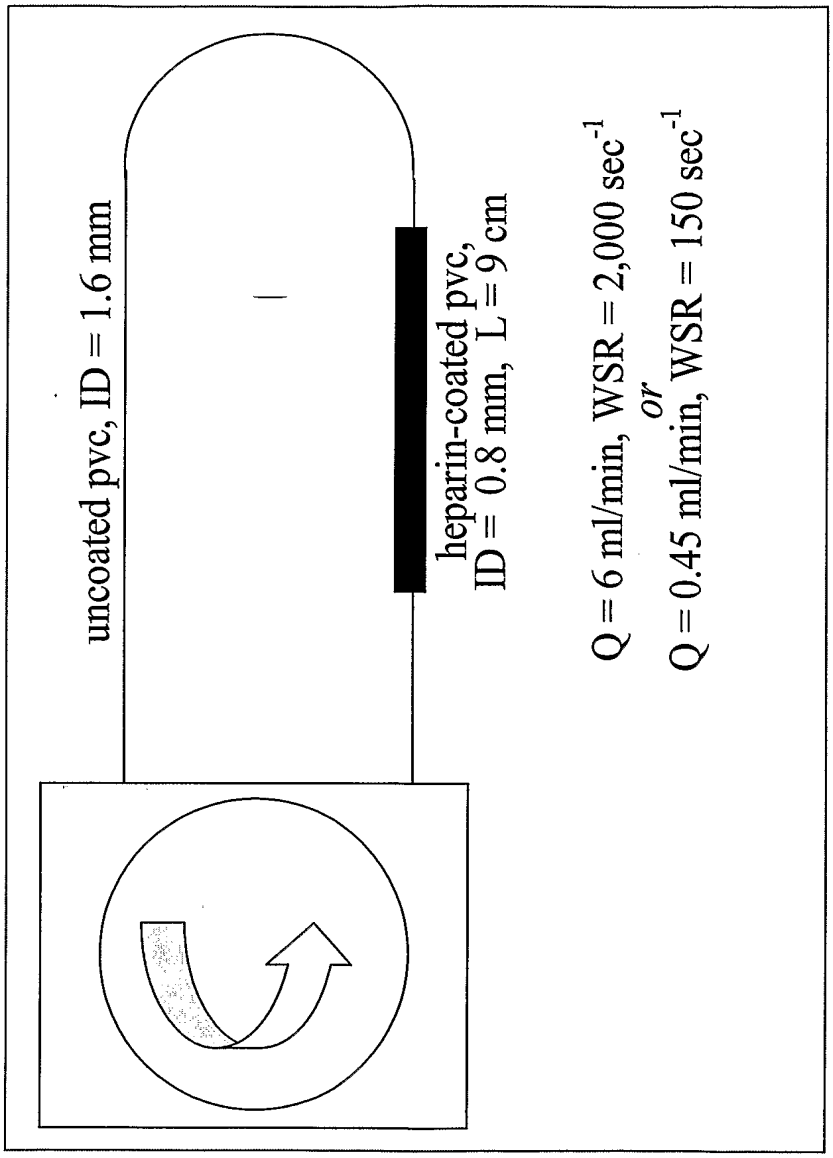


FIG. 11 Panel B

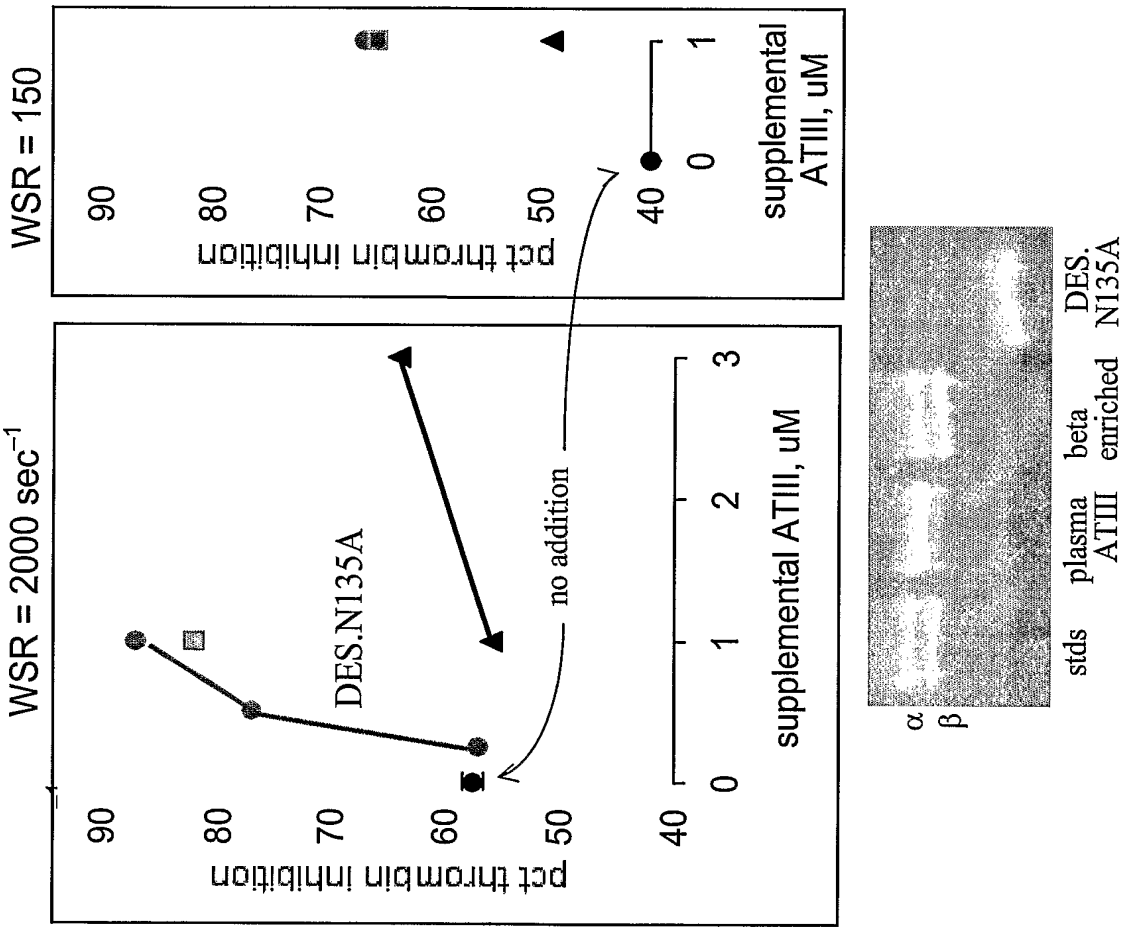
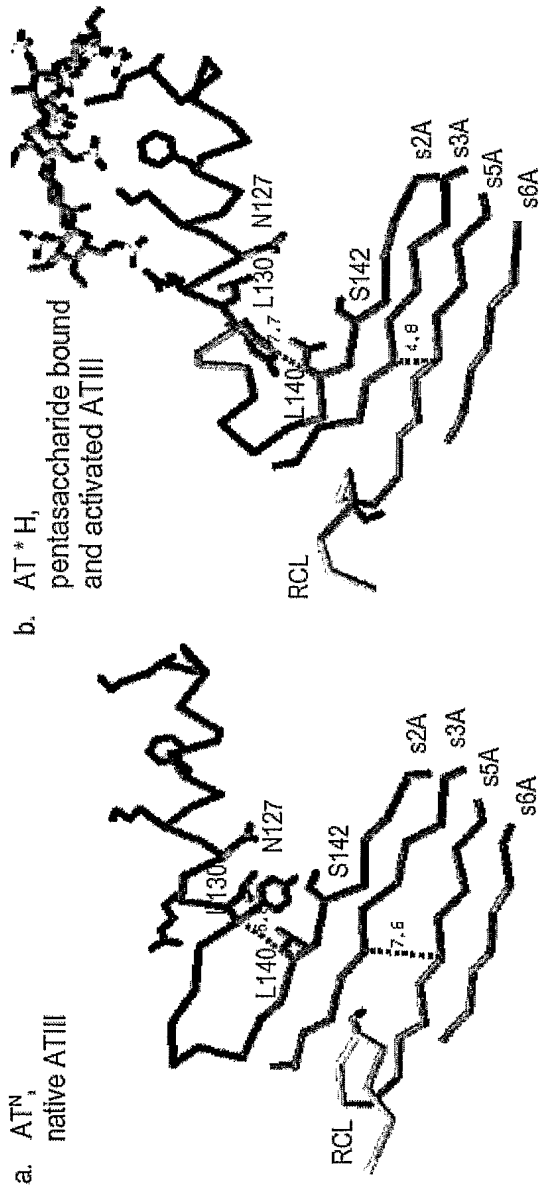


FIG. 12

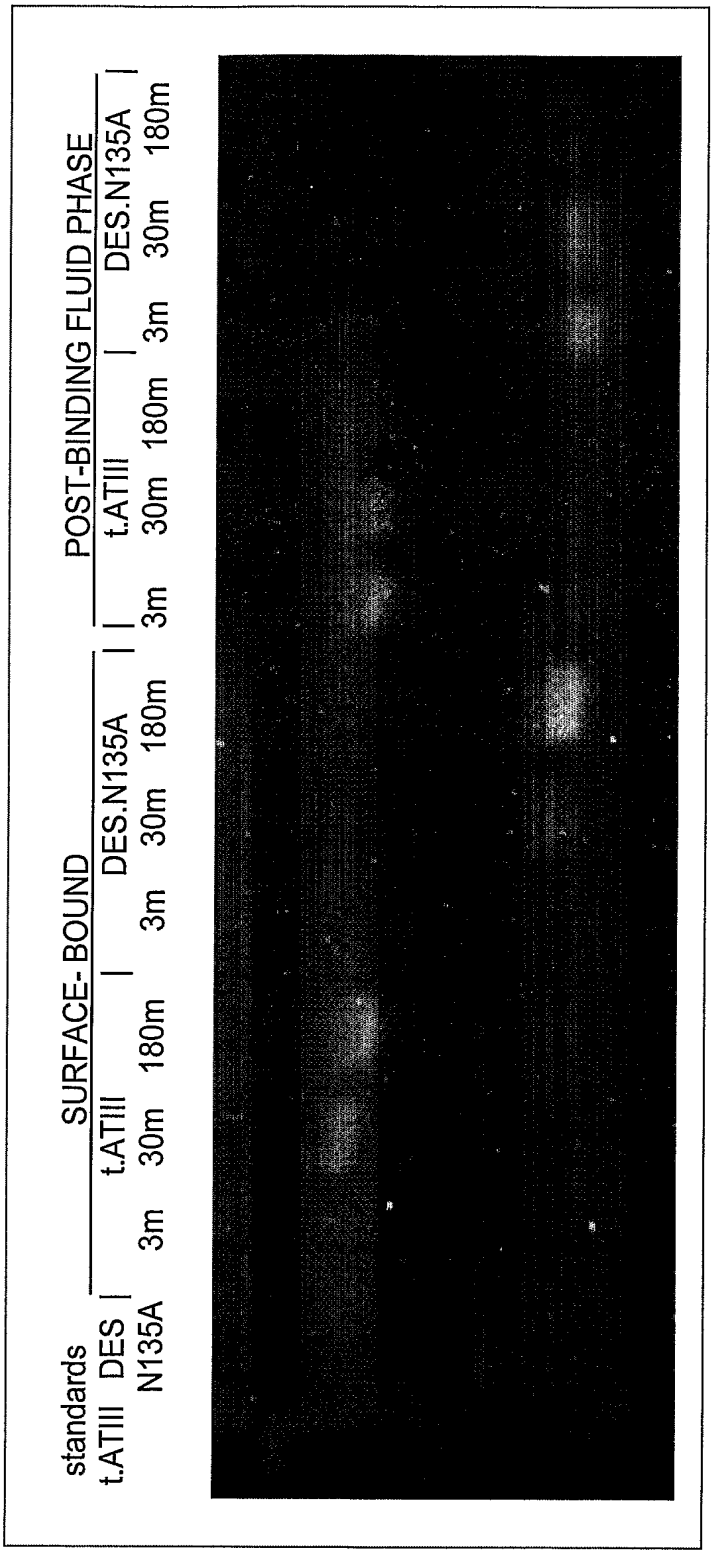


c.

Tyrosine-131 distal ring carbon interactions with helix D and strand 2A residues in native and pentasaccharide-activated ATIIIs, Å

					ATN (1E05i)	AT*H (1E03i)
Y131	CE1	-	S142	CB	3.5	6.4
Y131	CE1	-	L140	CG	4.1	4.1
Y131	CE1	-	L130	CB	4.3	8.3
Y131	CZ	-	L130	CB	4.0	9.3
Y131	CZ	-	L130	CD1	4.3	11.3
Y131	CZ	-	S142	CB	3.5	6.9
Y131	CE2	-	L130	CB	3.8	9.1
Y131	CE2	-	L130	CD1	4.3	11.2
Y131	CE2	-	N127	CA	4.2	9.2
Y131	CE2	-	N127	CB	4.2	9.3
Y131	CE2	-	S142	CB	4.2	7.4

FIG. 13


standards
t.ATIII DES N135A
SURFACE- BOUND
t.ATIII
3m 30m 180m
DES.N135A
3m 30m 180m
POST-BINDING FLUID PHASE
t.ATIII
3m 30m 180m
DES.N135A
3m 30m 180m